

G. E. Hubbard.

ON IDIOCY,

ESPECIALLY IN ITS

PHYSICAL ASPECTS.

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ON IDIOCY.

THE following article ought to have appeared shortly after the paper "On the Mental and Sensory Deficiencies of Idiots," in the last February number of the Edinburgh Medical Journal. In the present paper I shall confine my attention mainly to the physical and pathological aspects of idiocy. The causes of idiocy have been well treated in the little work of Dr S. G. Howe, of Massachusetts. It appears that whatever weakens the organism of the parent may be the predisposing cause of idiocy in the offspring. The scrofulous diathesis especially seems to favour its production. In other terms, there is a larger proportion of scrofulous or weakly parents who have idiotic children than of healthy parents who have idiotic children; but we cannot at present establish any closer connexion between scrofula, drunkenness, rachitis, and other manifestations of a weak and depraved constitution on the one hand, and idiocy on the other, or explain why these unhealthy states should in some cases check the growth or nutrition of the nervous centres, instead of affecting the growth or nutrition of other parts of the body or of all the organs alike.

Scrofula is certainly very common with idiots; but then again we know that many scrofulous children descended from scrofulous parents are of average intelligence, and that some have unusual mental activity. In cretinism we have a right to assume the existence of a specific cause existing in certain localities principally shut in valleys. This cause, whether existing in the air or water or both of them, is only known to us through its effects; but its action is much increased by the operation of whatever tends to weaken the constitution of the child in the district where cretinism is endemic.

Thus, children brought up in confined, dark, and dirty houses, ill fed and ill cared for, are more liable to become cretins than children who are brought up in the same place, but under more happy surroundings. Still, we see children brought up under every condition favourable to health sometimes falling a prey to the cretinism in places where the malady is rife. In a similar manner, although the children of parents whose constitution is weak are probably more liable to have idiotic children, it not infrequently happens that idiots are born into a family where the father and mother, and the sisters and brothers, are apparently quite healthy, and live in obedience to the laws of health. There is, however, no doubt that in families where neuroses exist, as manifested by lunacy, imbecility,

epilepsy, deafness, or other like disorders, idiocy is much more frequently met with.

It has been advanced that idiocy is a proof of the dying-out and degeneracy of a family, but it would seem from the statistics of the Larbert Institution that the number of children in families where idiocy has appeared is not less than the average. Out of 145 families, the average number of the children was 5.11, and although those who were idiots must be regarded as dead branches, many of the other brothers and sisters were vigorous and intelligent. Out of 149 families, seven had married their first cousins, and of these cases two had each two children imbecile, and one had three such children. The marriage of blood-relations seems to strengthen a pre-existing tendency to idiocy or insanity in the offspring, but does not appear to call it into existence. In places where cretinism is endemic, frequent intermarriages have been found to increase the proportion of cretins amongst the children.

In a healthy race living a pure and healthy life, I imagine that idiots will be rare, and that the proportion of those who become so from accidental causes will be greater; but in a society struggling under unhealthy and disquieting influences, idiotic children will be more numerous, especially if these influences act upon the constitution of the mother. Dr Seguin, in a lecture¹ delivered before the New York Medical Association, remarks, that idiocy is increasing in the State of New York, and finds the cause of it in the unsatisfactory social conditions which some people wish to introduce into this country.

"We overburden women," says Dr Seguin, "they overburden themselves, and choose or accept burdens unfit for them." "As soon," he says in another place, "as women assumed the anxieties pertaining to both sexes, they gave birth to children whose like had hardly been met with thirty years ago—insane before their brain could have been deranged by their own exertions—insane, likely, by a reflex action of the nervous exhaustion of their mother."

The antagonism created by social agitators of the gynagogue class seems to Dr Seguin to have already borne evil fruit. "Children gotten under such moral and other pressures cannot truly be said to be born from the union, but rather from the disunion, of their parents; conceived in antagonism, they can only be excessive in their tendencies, or monsters in their organization."

The unquiet, speculating life led by many in New York, where riches and extravagance, disappointment and failure, swiftly follow one another, has effects which Dr Seguin points out in a striking instance. "I have attended a mother of a remarkably fine family of four children, whose fifth was affected in this wise. During that pregnancy, her husband was deeply involved in speculations; he would say nothing then about his chances, but she knew daily, by the way he ate, how much he had lost. One day she saw him swal-

¹ New Facts and Remarks concerning Idiocy, by Edward Seguin, M.D. New York, 1870.

low his dinner without masticating at all; she fainted away, the child hardly moved after, and was born a cripple and an idiot."

Fright to the mother during pregnancy is a not very uncommon cause of idiocy.

Besides these general causes, whose vagueness is not favourable to scientific inquiry, there are more determinate exciting causes; the child becomes idiotic either through lack of development or nutrition, or through disease or injury befalling the brain before or after birth.

Certain diseases bring idiocy in their train, and much may be learned from studying the conditions under which this takes place. Some authors have divided idiocy into congenital and acquired,—a distinction which appears to me of little value where the pathological causes are the same. Most of the diseases which produce idiocy may occur before birth as well as after it, and we do not require a double pathological classification without any sufficient difference either in the nature of the lesion or its results. This brings me to the classification of idiocy, which I attempted, based upon pathological conditions. If we define idiocy as simply a deficiency of the psyche, then a mental qualification is what we must logically aim at. If, on the other hand, we define idiocy to be mental deficiency depending upon mal-nutrition or disease of the nervous centres occurring either before birth or before the evolution of the mental faculties in childhood, we look at it in a different aspect, and must classify it in a different manner. In studying idiocy in connexion with the diseases which give rise to it, one feels the want of some such classification, nor can we be content with a mental classification without a pathological one, or a pathological without a mental one. The human mind, bounded in its insight, requires to look at the subject in two aspects, and for the same reason that we require to see a solid body on every side, unless it happens to be transparent. In a similar way, we have different classifications for human beings according to the point of view from which we regard them. Take for example Socrates and Cæsar, Confucius and Timur Khan. In respect of their mental powers and pursuits, Confucius and Socrates would fall into the same rank as philosophers, and Cæsar and Timur Khan would come together as rulers or warriors. But then we might classify them with the eye of a zoologist, when Cæsar and Socrates would go together as Aryans, and Confucius and Timur Khan as Mongolians. In a like way, an epileptic idiot might fall under the same mental division as a hydrocephalic one, if we classify him from the degree of intelligence left. Nevertheless, we cannot refuse to take into consideration the modifying influence of the special disease upon the course and prognosis of the idiocy; and as a general rule the different divisions of idiocy proposed below have certain mental characteristics in common, somewhat in the same way as the Mongolians and Aryans seem to have got a prevailing character. It is clear to me, whatever may be the fate of the whole classification, that some of

its divisions, as cretinism, epileptic and paralytic idioey, have such marked characteristics that they will never be given up.

Coming to the study of idioey after having gained some experience in medicine, I have from the beginning viewed it from the standpoint of pathology; and my idea of idioey is compounded of the following classes, which are generalized from individual existing idiots who resemble one another by having the same or similar diseases, as they resemble the type of idioey by having mental deficiency with a corporeal disease.

1. Hydrocephalic Idioey. 2. Eelampsie Idioey. 3. Epileptic Idioey. 4. Paralytic Idioey. 5. Inflammatory Idioey. 6. Traumatic Idioey. 7. Microcephalic Idioey. 8. Congenital Idioey. 9. Cretinism. 10. Idioey by deprivation.

Of these forms, to which more may yet be added, I shall now treat in their order.

Hydrocephalic Idioey.

Hydrocephalus is one of the most fatal of the nervous diseases of children, as may be seen by a glance at the Registrar-General's Returns; but while many children die of water in the head, and some recover without their intellects being impaired, there are a few who neither die nor recover—they become idiotic. The disease turns chronic; the pressure of the fluid relaxes; the head ceases to increase; Wormian bones are thrown out where the edges of sutures are distant from one another; and the brain to a certain extent recovers from the pressure and stretching which it has received. Sometimes the hydrocephalus is congenital, coming on before, or more often shortly after, birth; at other times the hydrocephalus is acquired, coming on in the first few years of childhood. In this case it seldom appears before the tenth month, and is commonest from the fourth to the seventh year.

In some cases the hydrocephalus seems to have a dwarfing effect upon the general growth of the body; sometimes the child is deaf, probably from the stretching of the portio mollis within the skull through the effused fluid. Occasionally hearing is restored owing to the tension being relaxed or to the nerve becoming accustomed to it; more rarely blindness follows water in the head,¹ perhaps through the pressure of fluid upon the corpora quadrigemina, or on the optic nerves at the tuber cinereum. The sense of touch is in some cases dull. Squinting is not uncommon. The voice sometimes undergoes a peculiar alteration; the patient speaks in a lower key, and with a hollow timbre.

From the peculiar form of the head, there is generally little difficulty in recognising hydrocephalic idiots, though it occasionally happens that the head is not larger than usual, where the brain has been much diminished by the pressure of watery effusion; and some

¹ Dr Rud Leubuscher, in his work "Die Krankheiten des Nervensystems," Leipzig, 1860, s. 221, says that injury to the sense of hearing is rarer than loss or diminution of the sense of sight. My own remarks, however, refer to hydrocephalic idioey, not to acute or uncomplicated hydrocephalus.

men with heads hydrocephalic both in size and shape are possessed of ordinary intelligence. The size of the head does not form a safe criterion as to the amount of injury done to the mental powers. Seguin, in his book on Idiocy,¹ gives the case of a girl seventeen years old, whose head was thirty-seven inches in the largest circumference at its summit, and twenty and a half inches over the vertex from one foramen auditorium to another. The hydrocephalus commenced in the first year of life. "She began to speak when five years old. Her senses have always been acute, but she lost her sight five years ago. In 1865, she had spasms for the first time; since, she has grown weaker, and entered already in her period of decay. Though her brain was, we may say, drowned in an ocean of heterogeneous fluid, it kept up active communication with the world. She was cheerful, sung and talked until lately, used playthings as ordinary children do, liked to see bright objects waving before her eyes when she could see, and even now in cæcity she amuses herself by making papers rustle and move before her absent vision, muttering yet, though indistinctly, 'Hurrah for the colours,' 'Hurrah for the flag;' touching reminiscences of popular festivities which impressed at an earlier period."

As Rokitansky has observed, we ought to distinguish between acute or chronic hydrocephalus and hydrocephalus *ex vacuo*, in which fluid is poured out simply to fill up a reduction of the volume of the brain. This, however, is much more common in old age than in childhood. Hydrocephalus has been distinguished into internal and external. In the one, the fluid distends the lateral ventricles; in the other, it is between the brain and the membranes. Hydrocephalus externus alone is not very common; but there are some remarkable cases on record, where a large amount of fluid was collected between the skull and the brain, the brain being placed at the base of the cranium. In these cases the intelligence does not appear to suffer so much. It is not unfrequent to have hydrocephalus externus and internus at once. As Cruveilhier has remarked, the cerebellum generally escapes from the pressure of the effused fluid. Hydrocephalus is not unfrequently combined with epileptic fits, and sometimes with paralysis; and in these cases the prognosis is not so good.

Hydrocephalic idiots are frequently of very feeble constitution, and of a tubercular or scrofulous diathesis; nevertheless, if in tolerable health, they are more educable than some other classes of idiots, and generally improve under training. They are, as a rule, gentle in their disposition, and somewhat awkward in their motions.

As hydrocephalus leads to obtuseness and dementia rather than excitement and mania, it is not commonly seen in the brains examined in lunatic asylums.

Dr Leubuscher² has recorded some remarkable cases where consciousness has reawakened shortly before death, which he explains

¹ New York, 1866, p. 340.

² Op. cit., p. 22.

by the supposition of a partial absorption of the effused fluid. I have an account of a girl believed to be idiotic from hydrocephalus, who was noticed to improve mentally during her last illness, which was apparently consumption.

Eclampsic Idiocy.

Though eclampsia may appear in children of healthy parents, there is no doubt a predisposition hereditary in some families to take fits under exciting causes, which cannot be avoided. The most general, as well as one of the earliest of these exciting causes, is the cutting of the teeth. The child is thrown into fits, often long continued and returning with short intermissions, placing its life in the utmost danger. Most of those who survive, escape without any apparent injury; but some become permanently idiotic. Further experience has only confirmed the unfavourable prognosis which I ventured to lay down of eclampsic idiots, in my article upon the "Classification and Prognosis of Idiocy," in the *Journal of Mental Science*.¹ "Though the power of muscular motion, as well as the tactile sensibility, is generally well preserved, and special sense does not appear to be injured, the intelligence is in a great degree destroyed, and the child remains, comparatively speaking, uneducable. He can be taught more readily to work than to think." Often the child remains a mute. To this unfavourable prognosis there are exceptions, but relatively not very numerous. The remark of a writer on Epileptic Insanity² seems to hold good with our cases. "No principle has received a greater sanction from experience than that the earlier the age at which epilepsy springs up, the deeper it undermines the organic and moral constitution, and the more disastrous are its results."

The difference between eclampsic and epileptic idiocy is, that in the first form there is a succession of fits following close upon one another; after a time the child recovers its bodily health, the fits cease, leaving behind alterations in the structure of the brain, which have disordered and arrested its health and nutrition. In epileptic idiocy, on the other hand, the convulsions recur at more distant intervals; but the disease does not show the same tendency to disappear. A total cessation of the fits is rare, and the physician is generally pleased if he can succeed in increasing the length of the intervals between each attack by medical or dietetic treatment.

Epileptic Idiocy.

I apply this name to those cases where the epilepsy seems to be the cause of the mental obtuseness; for it ought to be kept in mind that congenital idiots are now and then subject to epileptic fits, which need not necessarily have a marked effect upon the intelligence, and in any case can only be regarded as a complication. Epilepsy, as

¹ October 1872.

² Dr M. G. Echeverria, in the *American Journal of Insanity*, July 1873.

is well known, is one of the commonest causes of insanity, as well as of idiocy, and in making our definition of classes it is difficult to know where to draw the line between epileptic idiocy and epileptic dementia. It is inconvenient to draw the line so as to include children under the heading of lunatics, in case they should be sent to asylums for the insane, where there is no proper provision for their training and treatment, and where, owing to their proneness to imitate bad examples, they rapidly deteriorate. If the epilepsy has caused the faculties to become impaired before the age of seven, it appears to me that the patients ought to be treated as epileptic idiots. There is a strong feeling against the admission of epileptics into training schools for idiots. They are often wild and irritable, and, though they generally possess an amount of intelligence which deceives those who do not take into consideration the existence of a disease which may be expected again and again to return, they are not easily taught, and are liable to lose what they have learned. If some progress has been made through the unwearied efforts of the teacher, a renewed attack or series of attacks has a tendency to wipe the new accomplishment away, and the teacher has to recommence his work over again. However, I am convinced that this unfortunate event is not so common as represented by some writers. With the majority of our epileptic pupils the continuance of the fits no doubt retards the growth of the intelligence, and the pupils are duller and heavier for a few days after an attack. When this has passed away, they again commence their tasks and take up their interrupted lessons without any loss of acquired knowledge being noted. In one case at least, in the Larbert Institution, the patient is generally duller before the fits come on, and his intelligence does not appear to suffer much from the immediate effect of the attacks, which are sometimes severe. On the other hand, the probability of a complete cure of idiocy is greater in the epileptic idiocy than in any of the other classes, save that of idiocy of deprivation.

Dr W. A. F. Browne,¹ and Dr Isaac Kerlin of the Pennsylvania Training School, have recorded cases of cure of epileptic idiocy, and take a more hopeful view of their prospects, and advocate their claims for admission to charitable establishments, from which they have been excluded. I have given a short abstract of a remarkable case,² which it may be worth while to reproduce.

A girl, whose father was a drunkard and epileptic, had fits when three years old, from which she recovered, and grew up to the age of fourteen without any deficiency of intelligence or bodily disease. "About this age the epileptic attacks again returned, and became very frequent, when she passed by degrees into a fatuous state. Her gait became tottering; often she was unable to sit up even in an easy chair, and she even required to be fed. Sometimes she

¹ See Dr Browne's views in his lecture on "Epileptic Mania," *Journal of Mental Science*, vol. xi. p. 352.

² In the *German Retrospect of the Journal of Mental Science*, July 1873.

would wander about at night, instead of sleeping, or fall into maniacal bursts of passion. After four years' illness, she was admitted into the asylum under Dr Wiedemeister, of Osnabrück, where she passed her time in the compartments used for dirty and noisy patients. The fits were both severe and frequent, and she was treated with bromide of potassium and oxide of zinc. Little hope was held out of her recovery; but, after being a year in the asylum, and five years ill with epilepsy, the fits began to be less frequent. In November, her catamenia first appeared, and in December the last fit was seen. She began to do simple pieces of work, her strength revived, and her intelligence gradually returned, and on the 23d of June 1872, after being three years in the asylum, she was dismissed, cured of imbecility and epilepsy. On her returning to the world, it was found that she had forgotten many things which she had once learned. She had again to be taught to sew and knit. She had entirely lost the use of speech; even during the period of her deepest fatuity, she used to sing songs which she had learned in the school, generally with the proper tunes; and when she was again sent to her lessons, it was found out she had not entirely forgotten reading and writing. During her fatuous condition she was not able to recognise her mother, and on her recovery she had entirely forgotten that her mother had pigs and cows; nor did she recognise her native place, nor even her home, when brought back to it."

Schroeder van der Kolk¹ gives another instance of a lad of seventeen, who was nearly idiotic from frequently-recurring attacks of epilepsy, who recovered after incisions being made in the scalp, and issues being kept up. "His mental powers, although not greatly developed, were remarkably improved; writing, arithmetic, etc., progressed satisfactorily; while he had a situation in a factory. The only peculiarity he manifested was tolerably constant irritability of temper. It was, however, extremely important that from time to time, instead of an attack, hæmorrhage took place from the wound, with the effect of greatly clearing his head."

The lad remained for eighteen months free from epileptic fits, when he died of consumption. "From this case," observes the distinguished Dutch pathologist, "it is particularly clear that idiocy, or apparent dementia, after epilepsy, is quite a different disease from dementia after idiopathic mania, which always depends upon degeneration and atrophy of the cortical substance, and is incapable of cure."

Cases like these should be held in mind to save us from desponding. Unfortunately they are not common, and Dr Shuttleworth, once Assistant-Physician at Earlswood, and now Medical Superintendent of the Royal Albert Asylum at Lancaster, has remarked that there were eighty epileptics at Earlswood, and that of these

¹ On the Spinal Cord and Medulla Oblongata, and on Epilepsy. Sydenham Society, London, 1859, p. 272.

there were between forty and fifty cases incapable of improvement, whereas of the other idiots no more than six per cent. were entirely unimprovable.

The rules of the Larbert Institution are not favourable to the admission of epileptic idiots, and the less promising cases are generally excluded; but of eighteen patients who found their way into the house, seven did not appear to improve, one of them is not recorded in the case-book, four improved a little, and six improved considerably. In three of these cases especially the progress was very satisfactory. The pupils increased in intelligence, and the fits diminished so notably in number, that I consider a complete cure not improbable. Of two of these cases, I had at one time a very unfavourable opinion, and I know that it was at one time contemplated to remove them from the house. In the matter of treatment, bromide of potassium seems to have a less favourable effect upon the inveterate cases of epilepsy which come into an institution for idiots, or into an asylum for lunatics, than it has in outdoor practice. Where improvement follows treatment, I am disposed to attribute it as much to diet as to medicine. Benefit is sometimes derived from excluding flesh meat from the dietary of epileptics, a piece of advice which I got long ago from Trousseau, on his visits to the Hôtel Dieu, and which has been lately repeated by Dr Hughlings Jackson. It is likely that the gymnastic training given by us is also of advantage in treating epilepsy.

"During the last three or four years," remarks Dr Radcliffe, "I have seen several cases of epilepsy, chorea, and hysteria, in which undoubted good has resulted from the adoption of a regular course of suitable gymnastic exercises."¹

However great the improvement may be, the patient is never secure against falling back again, save by the total cessation of the epileptic fits. Sometimes the mental powers continue to increase until puberty or later, and then the fits become more frequent, and either bring the sufferer to his end or render him insane. In some patients met with in ordinary practice, epileptic fits seem to occur for many years without apparently diminishing the mental power, which, however, in these cases is seldom of a brilliant character.

Such is our dearth of direct observations that we are willing to allow Dr J. Crichton Browne's² opinion to pass for the time that the lesions in the epileptic idiot are the same as those which are described in the epileptic dement, and it is not unlikely that there may be little difference between the morbid appearances in the clampsic and epileptic idiot. The morbid changes which he has found after epileptic dementia are atrophy of the brain, evidenced by some opacity of the arachnoid, diminished size of the gyri,

¹ Lectures on Epilepsy, Pain, Paralysis, etc., by C. B. Radcliffe, M.D. London, 1864, p. 227.

² Journal of Mental Science, April 1873.

and enlargement of the sulci, which contain some compensatory serous fluid, a quantity of which also generally occupies the enlarged ventricles. The atrophy of epilepsy is moderate in degree. It rarely approaches that of old age, chronic alcoholism, or simple brain-wasting.

Out of fourteen examinations of the brains of patients suffering under dementia and epilepsy, MM. Bouchet and Kazauvielh found hyperæmia of the brain and membranes in fourteen cases, indurations partial or general in seven cases, softening partial or general in seven cases, and the convolutions small and atrophied in seven cases.¹ Atheroma of the vessels is not commonly met with; but traces of extravasated blood are sometimes observed under the membranes. Dr Howden, of the Montrose Asylum,² observes that "effusions in the pia mater are not unfrequent in epileptics; those I have met with are of old standing, and had assumed the character of rusty gelatinous deposits." Trousseau³ believed that after severe attacks of epilepsy slight effusions of blood are produced in the substance of the brain, in the membranes, and in the spinal cord, similar to the ecchymoses which appear in the subcutaneous tissue of the skin. Effusions of larger size have been described by Calmeil⁴ and others. These effusions explain the paralysis which sometimes follows epileptic fits, and which may pass away in a few days. On the other hand, Dr Russell Reynolds⁵ remarks, that although the epileptic convulsions are not rarely followed by profound coma and a general appearance of apoplexy, "it is exceedingly rare to find that actual cerebral hæmorrhage has occurred."

It is likely enough that in epileptic attacks which only obscure the intellect in a passing degree, dilatation of the vessels is the only lesion produced, and that this is succeeded by albuminous deposit outside the capillaries when the attacks become more severe and persistent, and that hæmorrhage only appears in those violent cases which are found in lunatic asylums. In several instances where I had an opportunity of being present at the post-mortem examination of epileptic lunatics, increased hardness of the brain and dilatation of the vessels were noted. Hardening of the olivary bodies was not always present; but in some cases was very well marked. In other instances, no change visible to the naked eye was discoverable.

These alterations, noticed by different writers, are the results of the epilepsy, but in their turn the causes of the idiocy or dementia.

¹ *Récherches sur l'Encéphale, sa Structure, et ses Maladies*, par M. Par-chappe. Paris, 1838, p. 200.

² See his *Analysis of the Post-mortem Appearances in 235 insane persons*, p. 5.

³ *Clinique Médicale*. Paris, 1868, tome ii. p. 97.

⁴ There is a most instructive series of cases of brain disease, with their accompanying lesions, in the *Traité des Maladies Inflammatoires du Cerveau*, par le Dr L. F. Calmeil. Paris, 1859.

⁵ Reynolds on Epilepsy, quoted by Dr Howden, *op. cit.*

Paralytic Idiocy.

Cerebral apoplexy is not common with children; but it is clear that paralysis associated with idiocy must have a centric origin. I have seen about a dozen of such cases. They seem to improve mentally rather than physically. The mental powers could be increased by cultivation; but the paralyzed limb either did not acquire strength, or improved by slow degrees.

In the *Journal of Mental Science* for October 1873, I have given the description and neuroscopy of a case of paralytic idiocy which began in the eighth month of the child's life. He died when eight years old of bronchitis. No trace of apoplectic clot could be found in the brain. There was a spot of white softening about the size of a walnut on the roof of the left ventricle above the posterior cornu. This lesion, whatever its date, was on the same side as the paralysis. The lateral ventricles were distended with fluid. The brain was fully formed.

Injuries to the brain causing paralysis may take place before birth as well as after it. Before birth the brain may suffer lesions which would entail loss of life after birth. Hence the cases of paralytic idiocy where there is most destruction to the nervous tissue are congenital ones.

Schroeder van der Kolk has an interesting case of atrophy of the left hemisphere of the brain occurring in a female imbecile, aged 27. She had from her earliest infancy been paralyzed on the right side. The right hemisphere of the brain was quite healthy, but the left was much smaller. The difference of size extended to the base of the brain. The cerebellum was atrophied on the opposite side, that is, the right side, and below the decussation; the atrophy of the spinal cord passed also to the right side from the left hemisphere. The learned author has collected a considerable number of such cases where there was paralysis and diminution of one side of the body, and the opposite side of the brain was atrophied. This appears to be owing to inflammation either before birth or shortly after it. It is to be noted that in these cases when one hemisphere was completely destroyed, the paralysis is not total. The arm is generally more paralyzed than the leg.

"With respect to the symptoms produced by this unilateral atrophy of the brain, they manifest themselves partly in the more or less defective exercise of the mental powers, and partly extend their influence, as I have shown at length in the above case, over the rest of the body. That in atrophy of one-half of the cerebrum, the psychical powers should be blunted or paralyzed, might perhaps be assumed as generally true (and, in fact, such atrophy is most usually met with in idiots); still it is far from being universally the case, for although in some instances mention is made of rather blunted mental powers, examples also occur where, with atrophy of one hemisphere, the intellectual faculties appear to be in their normal condition."

He refers to a number of curious cases going to show that the

loss of one-half of the brain may be combined with the perfect use of the intellectual faculties.¹

"Everything, in my opinion, depends upon the more or less healthy state of one hemisphere of the brain. If, as from the nature of the case seldom occurs, the inflammation and affection of the pia mater has not extended to this hemisphere, if the gray matter under the cerebral convolutions has here continued perfectly sound, there is no reason why this remaining hemisphere should not be able to act without impediment in the exercise of those functions which are necessary to our mental powers, just as one eye sees as sharply though the other be lost. But where the gray matter is injured in both hemispheres, particularly anteriorly, disturbance of the intellectual faculties will be inevitable."

Dr Schroeder van der Kolk adds in a note:—"A remarkable case, where there was probably atrophy of one-half of the brain, is communicated by Wigan, in Forbes Winslow's *Journal of Psychological Medicine*. (See Damerow's *Algem. Zeitschrift für Psychiatrie*. Berlin, 1851, 8 b. 2 h. p. 279.) A boy, aged fifteen, had an inequality of the skull, as if the left half of the brain was cut off from above towards the ear, and was covered with a flat bone, so that the size of the left hemisphere could certainly not amount to more than one-third of that of the right; at the same time, he had a tottering gait, without being paralyzed. This boy, who at first appeared to be quite idiotic and incapable of learning or understanding anything, with a stupid appearance, had, under constant instruction, three years later, grown into a strong lad, and his intellectual faculties were fully developed, while his brain was increasing in size, the left hemisphere, however, always continuing about one-third less than the right."

In another note he says:—"Since the publication of this essay, I have six or seven times observed in living subjects this lesion with shortening and atrophy, especially of the arm, opposite to the atrophy of the hemisphere. In the majority of cases, a greater or less degree of idiocy existed; perfectly unimpaired intellectual powers I never witnessed with this lesion."

In these cases there is often no inequality in the size of the skull on the atrophied side; the calvarium is either thickened, or the empty cavity is filled up with fluid.

It does not seem to me necessary to make any distinction between those cases where the paralysis has occurred before birth or in early infancy. Indeed, it is sometimes difficult to ascertain whether the paralysis was congenital or not. I have had good opportunities of studying one case, where the paralysis must have begun before birth. The head is of average size, and appears symmetrical. There is no deficiency of the senses on either side, but the left side of the body is everywhere smaller than the right. The left arm is

¹ Translated from the original, by Wm. Daniel Moore, M.D., T.C.D., etc. New Sydenham Society, London, 1861, pp. 150, 154, 155.

more paralyzed than the leg, and shorter and much thinner than the sound one. The hand is bent upon the forearm, so as to make it quite useless. The left leg is thinner and shorter than the right, so that he limps, and cannot walk far without exhaustion. This boy, who is now thirteen years old, though decidedly imbecile, has a good deal of shrewdness and some humour; but is slower at the school than one would suppose from his conversation. He can read words of one syllable, and is good at music, but deficient in arithmetic.

It not unfrequently happens that idiots cannot pronounce particular sounds or letters, or can pronounce them only in particular combinations. They often substitute one letter for another. One imbecile female, aged twenty-three years, cannot sound P, T, and K, using in their places, B, D, and G, the sounds which require an adjustment of the muscles of voice most nearly resembling the letters she cannot imitate; B and P being formed by approaching the lips, D and T being formed by approaching the tongue to the arch of the palate; G and K are gutturals. In B, D, and G, the mouth is closed and opened more slowly than in P, T, and K, in which the action of the lips, tongue, and throat is more abrupt. This woman has the upper alveolar ridge so prominent that the lip does not stretch properly over it. It is often a difficult question whether these deficiencies in pronouncing certain sounds are owing to paralysis of different nervous filaments or motor centres of nerves, the remains, perhaps, of more extensive paralysis or nervous weakness. In some instances this is no doubt the true explanation. We have, for example, a boy aged thirteen, partially hemiplegic, who was utterly unable to pronounce K at the beginning of a word, and sounded the letter G imperfectly. This was owing to deficient power in the muscles of the uvula and soft palate. On being asked to pronounce K with the mouth open, the uvula could be seen to be drawn to the side opposite to that on which the arm and leg were paralyzed.

We have a child ten years of age who only began to speak about two years ago. At present, though possessing more intelligence than many children who talk volubly, he cannot pronounce many sounds, such as K, Th, B. He always substitutes T for K, and P for B. This boy has a slight paralysis of the left side of the face. We have many other cases of children who cannot pronounce particular sounds, in whom no other muscular deficiency appears to exist. There are, however, other cases in the house, who have special deficiencies of motion in the arms or legs, which appear at gymnastic drill.

One difficulty in regarding these as cases of deficient pronunciation appears to me that most of the muscles used in speech are the same as those used in chewing and swallowing the food; and if we assume paralysis in the one function, how do we account for it not taking place in the other? We know that in labio-glosso-pharyngeal paralysis, which has generally been found to be associated with

disease of the pons, or of the corpora olivaria, swallowing is impaired along with that of speaking. This consideration appears to me not without weight; but it ought to be borne in mind that the articulation of words demands a much finer adjustment of the muscles than in moving the lips or swallowing, and that a loss of power over the muscles generally commences with difficulty or hesitation of the speech before any other motions are affected. This is well known to be the case in drunkenness and general paralysis of the insane. Stammering consists in the momentary inability to pronounce a sound or to connect it with other sounds, and is owing to deficiency in the co-operative power of the larynx with the movements of the mouth; but though stammering may be associated with chorea of other muscles, it often exists with perfect command of the rest of the muscular system.

Max Müller remarks: ¹ "There is one class of phonetic changes which take place in one and the same language, or in dialects of one family of speech, and which are neither more nor less than the result of *laziness*. Every letter requires more or less of muscular exertion. There is a manly, sharp, and definite articulation, and there is an effeminate, vague, and indistinct utterance. The one requires a will, the other is a mere *laissez-aller*. The principal cause of phonetic degeneracy in language is when people shrink from the effort of articulating each consonant and vowel; when they attempt to economize their breath and their muscular energy."

This species of indolence is very common with idiots. They alter difficult sounds for others which they can pronounce more easily, miss out articles, and shorten words; the tendency being to reduce all words to one syllable.

A singular analogy may be found between the aberrations of idiots from common speech, and those which time has brought about amongst peoples who once spoke a common dialect, as in the Aryan and Semitic families, each from a separate *Ursprache*, and the better-known example of the derivation or corruption of the different Romance languages from the Latin. It appears, as Max Müller argues, that in the end we must come to a physical explanation in the structure of the organs of speech. Certain races prefer certain sounds, because they can utter them more easily; and this must be referable to a facultative difference of nervous or muscular energy giving greater or less power to particular muscles, so that some modifications of the expelled air of the chest are more easily made than others by the majority, and consequently such-and-such a pronunciation is preferred. In this way whole nations have given up using sounds common in the language of others, just as idiots avoid or cannot pronounce certain sounds.

The Latin *aqua* became *agua* in Spanish, *eau* in French, and *apa* in Roumanian. From the same root the Romans formed *sto*, the

¹ Lectures on the Science of Language, by Max Müller, M.A., etc. London, 1864, p. 176.

Greeks ἱστῆμι. Many nations find it difficult to begin a word without a vowel, and so the Welsh changed *schola* into *ysgol*, the French into *école*; the Spaniards in Peru said *escola*. The Hindustanis always say *ischool*, *istable*, when they have to use such words. The Chinese have no R in their language; the Mexicans had no B, V, F; the six nations amongst the American Indians have no labials.¹ The Arabians have sounds which we can scarcely imitate in their *khe* and *ghain*. The people of the Society Islands, in trying to pronounce Captain Cook's name, said *Tute*, exactly what several of our children would say. In like manner, I could find counterparts to many of these linguistic variations in cases of idiots, who in speaking interchange certain letters or sounds, but it would probably be tiresome to pursue the subject.

Inflammatory Idiocy.

I have not been able to collect many cases of inflammatory idiocy. It would appear from the researches of Jastrowitz² and others, that inflammation of the brain occasionally occurs before birth, and that this sometimes extends down the spinal cord. Such cases are at present not capable of detection until after death. It might be supposed that inflammation of the brain following upon scarlet fever, measles, typhus, and smallpox, would be common causes of idiocy, as they are of deafness; and they are frequently stated to be so by the parents of idiots. Nevertheless, it is extremely difficult for me, who rarely see the commencement of a case, to prove that idiocy, after all, did not precede, instead of follow, the fever. A physician in extensive practice in a large town has opportunities of studying the causation of idiocy from actual observation, which any one who has attended to the subject must know has a different value from the theories of parents.

The case of F. Q., published in the *Journal of Mental Science*,³ seems to be one of inflammatory idiocy, and that of K. I. is probably another; nevertheless, it was not till after the necropsy that this could be made out.

In a Report of the Institution at the Hague for Young Idiots,⁴ out of 84 boys and 56 girls, two boys and one girl are said to have become idiotic from measles, one girl from typhus, and one from hooping-cough. The cases of inflammatory idiocy which we have met with were of different grades of intelligence; and it is evident that the injury from inflammation must depend in a great measure from its extent or situation, which we have no direct way of measuring during life.

¹ Max Muller, op. cit., p. 163.

² See his valuable article on the "Encephalitis and Myelitis of Infancy," in the *Archiv für Psychiatrie*, Band iii. Heft i.

³ October 1873.

⁴ *Vijfde Verslag van het geneskundig Gesticht en de daaraan verbonden Dagschool voor minderjarige Idioten te 'Sgravenhage over de Jaren, 1864, 1865, en 1866*, p. 72.

Traumatic Idiocy.

Traumatic idiocy ought to be distinguished from inflammatory idiocy, for although inflammation is likely to follow a blow on the head, it may be small in comparison to the damage done by the direct injury which the brain experiences from confusion, incision, division of the nervous tissue, or depression of the skull.

Owing to the softness of the bones of the skull in the new-born infant, as well as the looseness of the sutures, displacements and other injuries are not uncommon during parturition. As the head of the male infant is a little larger than that of the female, he is thus more liable to suffer injuries at birth. This may serve to explain why male children are more subject to idiocy, deafness, and diseases of the nervous system, than female children.

Dr Langdon Down,¹ in a paper on "Some of the Causes of Idiocy and Imbecility," has remarked, that "out of 2000, 24 per cent. were first-born children. He regarded two causes as potential in these cases: (1) pressure on the cranium, (2) suspended animation from retarded labour. He also attributed something to the more exalted emotional life of women during their first pregnancies. Among primiparous idiots, one-fourth had been born with suspended animation. While the ratio of sex among idiot primiparæ was 3 males to 1 female, the ratio of those born with suspended animation was 5 males to 1 female, indicating the influence of the increased size of the male cranium over that of the female."

I am not disposed to disagree with this conclusion of Dr Langdon Down, but cannot see how he strengthens his case by finding out that 24 per cent. of idiots were first-born children. Why not? Twenty-four per cent. of all children in England must be first-born children, and first-born idiots scarcely bear their due proportion to the healthy children of the country, for the average number of children to a marriage in England is 3·9; and if we remember that first-born are more numerous than other children, as sometimes there are no second-born ones. Dr Down's statistics seem here to be against his conclusion. Out of a hundred and forty-five families, mostly from Scotland, in which the average number of the children was 5·11, only 18·6 per cent. were eldest children. From this calculation four were excluded, as they were only children. The proportion of first-born children amongst idiots ought to be greater in England than in Scotland, because Scotch marriages are more productive (4·4 to 3·9); and the proportion will be higher still in France, where the average of children is still smaller than in England.

Though I am disposed to believe that the increased pressure to which the human head is exposed during labour is the cause of the preponderance of male over female idiots, there are cases which make me suspect a more occult influence. I know of instances

¹ See the Report of it in the British Medical Journal, 11th Oct. 1873.

where there were as many as three male idiots in a family, all the girls escaping. If there were a history of difficult labour, or suspended animation, occurring with the male children, and not with the female, the causation would of course be clear; but I have reasons for believing this cannot be made out. It is worthy of notice that, in a list of thirty-nine microcephales furnished by Vogt, only ten are females.

As elsewhere observed, the older a child gets the more liable are injuries to the brain to prove fatal; hence the number of cases where idiocy can be traced to falls or blows upon the head is not very large. At the same time, parents are extremely ready to attribute the idiocy of their children to an accidental fall or blow. As such accidents, however, do not often occur till the child begins to walk, and as this is almost always late in the case of idiots, we have here a criterion which ought to be made use of. In any case of idiocy which is put down by the parents to a fall on the head, the medical practitioner ought to make careful inquiries as to the existence of hereditary neurosis, the occurrence of fits or other diseases likely to be the cause of idiocy, as well as the nature, extent, and immediate consequences of the injury in question. There are, however, cases of idiocy which must be put down to external violence to the head. Setting aside those occurring at birth, such cases generally belong to the higher grades of imbecility, and, as the reader may imagine, they are not easily classified.

The amount of injury to the mental powers is variable, depending upon a number of circumstances it would be difficult and tedious to specify. In most of the cases which I have seen, the patient was simple-minded, or imbecile, rather than belonging to the lower grades of idiocy.

It may be noticed, that some writers have seriously advanced that a violent blow or concussion upon the head has occasionally effected a cure of idiocy or gross obtuseness of intellect. This is naturally a very rare event, even in upper-class schools, and the instances that are given of it do not appear to me to be always trustworthy. I have seen it, for example, asserted in several books¹ written by physicians of reputation, that Father Mabillon, a celebrated writer upon ecclesiastical antiquities, was an idiot till the age of twenty-six, when he had the good luck to fracture his skull, was trepanned, and changed into a learned writer upon ecclesiastical history. This is not the only one of these medical anecdotes copied from one book into another, which cannot stand inquiry.

The following are examples of traumatic idiocy after the dangers attending birth had been passed:—

N. X. was the son of healthy parents, in whose family no infirmity of mind had appeared. He began to walk and speak at the usual time, and was a thriving, intelligent child. When four years

¹ See, for example, Dr Forbes Winslow's *Obscure Diseases of the Brain and Mind*, London, 1863, p. 371.

old he got a fall from a pony, lighting upon the head. There was a depression stretching from the nasal eminence to the middle of the forehead, one and a half inch long, marking the seat of injury. He grew up to be a strong young man, with a head of good size. He could read and write, and had some knowledge of arithmetic. He was fond of reading amusing books like the Arabian Nights. He was garrulous and frank in conversation, and not very easily managed. He was distinctly simple-minded, not having more intelligence than a child of eight years of age.

B. N., though late in walking and speaking, was not observed to be idiotic till after a fall on the crown of the head. A cart, which she was in, was upset, and she was found under, stunned. There is no record of idiocy or insanity in the family. She is well-made, and comely in appearance. She is now sixteen years old. She can read little stories for her own amusement, and can do some household work. She may be expected to go on improving, having been only eighteen months under training.

Microcephalic Idiocy.

As far as my own measurements go, they confirm the conclusion of Esquirol, that the average size of the heads of idiots, excluding those of hydrocephalic ones, is somewhat smaller than the average size of healthy people; but to this rule there are many exceptions. Some have heads larger than the average size of sane individuals of the same age; and I have measured heads of people of normal intelligence, which are smaller than any in the Larbert Institution, with two or three exceptions. Moreover, those idiots who have larger heads do not surpass in intelligence those who have smaller ones. Save in the cases of hydrocephalic and microcephalic idiots, the size of the head gives no estimate of the comparative intelligence of the children.

Seguin gives an able summary of the state of the question in the following passage:¹—"Gall, giving a strong impulse to the investigation of the functions of the brain, had called up the question of the cause of idiocy: a skilful theorist, he thought he had discovered in idiots proofs of the truth of his system of phrenology. The authors who succeeded him—Gorget, Esquirol, Lelut, Foville, Calmeil, Leuret, Pritchard—seem, on the contrary, to have studied idiocy only to use its phenomena for the destruction of the system of Gall, but not for the benefit of the poor idiots whom they declared incurable. With their single polemical object in view, they spent thirty years in measuring and weighing the heads of living and dead idiots, and they arrived at the following conclusions:—

"1. No constant relation exists between the general development of the cranium and the degree of intelligence.

¹ See Report of the Commissioners on Idiocy to the General Assembly of Connecticut. New Haven, 1856, p. 57.

"2. The dimensions of the anterior part of the cranium, and especially of the forehead, are, at least, as great among idiots as among others.

"3. Three-fifths of idiots have larger heads than men of ordinary intelligence.

"4. There is no constant relation between the degree of intelligence and the weight of the brain.

"5. The different degrees of idiocy are not measurable by the weight of the brain.

"6. A cranium, perfectly formed, often encloses a brain imperfectly formed, irregular, etc.

"7. Sometimes the brain of idiots presents no deviation in form, colour, and density from the normal standard; it is, in fact, perfectly normal."

It is, however, agreed that there is a certain minimum size of head below which the possessor is necessarily an idiot. Voisin says that the proper exercise of the intellectual faculties is impossible with a head of from eleven to thirteen inches in circumference, and a measurement of eight to nine inches from the root of the nose to the posterior border of the occipital bone. To this rule there has never been an exception. He thinks that heads from fourteen inches to seventeen inches in circumference, and from eleven to twelve inches for the arc comprised between the root of the nose and the foramen magnum, are too small for ordinary intelligence; but heads of from eighteen to eighteen and a half inches, though smaller heads, allow of the regular exercise of the intellectual faculties. Mr George Combe, who must have measured a large number of heads, apparently quoting this passage of Voisin,¹ renders it, "heads of eighteen inches round give intellectual manifestations regular, but deficient in intensity." Mr James Straton measured the head of a boy in Aberdeen of eighteen inches circumference, whose brain, by his system of computation, was estimated at 82 cubic inches; "but it was well balanced, the constitutional temperament highly nervous, and the boy is quite as intelligent as could be expected of his age in his circumstances."²

I think we may therefore assume that below seventeen inches in circumference the manifestations of intellectual power would be feeble. But heads of this small scale are rare even amongst idiots, for idiocy is generally the result of disease, not of smallness of the brain.

Microcephaly is the rarest of all kinds of idiocy; nevertheless, owing to the speculations of Darwin, microcephalic idiots have

¹ I give the sentence in the author's own words:—"Les têtes de dix-huit pouces à dix-huit pouces et demi sont encore de petites têtes quoiqu'elles permettent à l'exercice régulier des facultés intellectuelles." *De l'Idiotie chez les Enfants*, par Felix Voisin, Médecin en Chef de l'Hospice des Aliénés de Bicêtre. Paris, 1843, p. 73.

² See Review of Contributions to the Mathematics of Phrenology, by James Straton, Zoist, vol. iii. p. 426.

been carefully studied, whereas those who possess brains of normal size have met with little attention. Charles Vogt has collected, from all available sources, as many as forty-two cases of microcephales, and his monograph¹ will probably remain the principal work on the subject for a long time to come.

Microcephaly may be either general or partial. Certain portions of the encephalon may be abnormally small or altogether wanting; but in general the deficiency consists in the smallness of the hemisphere. The nerves of special sense are generally well developed, and the ganglia of the base of the skull and the spinal cord are much nearer the normal size than the hemispheres. The cerebellum also is much longer than in the normal brain. In the case of a microcephalic idiot in the asylum at Barcilly, the cerebellum was one-half of the weight of the cerebrum, the ordinary relation being one to eight. In many cases the superior sutures of the cranium are closed. In three heads of microcephales dissected by Gratiolet, the sutures by the base of the skull were behind the usual stage of development, while those above were closed; the inverse condition is often met with in cretins. So many cases have been collected of microcephales with open sutures, that it is not likely any one² will continue to hold that the small size of the brain is owing to the sutures closing in and thus hindering its growth. Even in those cases where the sutures have closed in before birth, and which it must be granted are not uncommon, how can it be decided whether the brain ceased to grow because the sutures are closed, or whether the sutures closed in because the brain ceased to grow, or, lastly, whether both the brain and its coverings ceased to grow under the influence of a common cause? It seems to me that if the sutures closed in and the brain continued to grow, the symptoms described as following hypertrophy of the brain would be produced, which I think is not the case.

M. Cruveilhier³ speaks of a microcephalic child which lived eighteen months, where the vertical diameter of the cranium measured no more than an inch. "This child," he adds, "never gave any sign of intelligence; its limbs were incessantly in movement; it expressed its wants by cries; all the bones of the cranium were

¹ Mémoires sur les Microcephales ou Hommes-Singes, par Charles Vogt. Genève-Bale, 1867.

² It seems to me that Vogt has misstated the views of Virchow when he says that the German pathologist holds that—"La microcéphalie doit être nécessairement combinée avec les synostoses prédominantes de la voûte crânienne."—P. 88. In reply to this, it is enough to cite Virchow's own words: "Dass es Fälle von Mikrokephalie ohne Synostosen der oberflächlichen Nähte gibt habe ich früher erwähnt."—Untersuchungen über die Entwicklung des Schädel-Grundes, von Rudolf Virchow; Berlin, 1857, s. 80-105. Virchow über Die Entwicklung des Schädel-Grundes, s. 80-105. Rokitansky, Lehrbuch der Pathologischen Anatomie, Zweiter Band, Wien, 1856, p. 433. Dr Westphal, in Proceedings of Berliner Medicinisch-Psychologische Gesellschaft, reported in Archiv für Psychiatrie, iv. Band, 1 Heft; Berlin, 1873, s. 261.

³ Anatomie Pathologique Générale. Paris, 1856, tome troisième, p. 164.

united without any suture." Cruveilhier does not describe the appearance of the brain, which must have been so small. It died of convulsions, to which it was subject from birth. Professor Turner¹ cites the case of an idiot recorded by Theile, where the brain weighed only 10·6 ounces; another case, by Mr Gore, where it weighed 10 ounces and 5 grains; and a third case, from Mr Marshall, where the weight was as low as 8½ ounces. The heads of the Aztecs were amongst the smallest known. These were two children who were exhibited in America, England, and France, about twenty years ago, with a trumped-up story about their origin. The following description is taken from Dr Dalton's *Treatise on Human Physiology*:²—

"They were boy and girl, aged respectively about seven and five years. The boy was 2 feet 9¾ inches high, and weighed a little over 20 pounds; the girl was 2 feet 5½ inches high, and weighed 17 pounds. Their bodies were tolerably well proportioned, but the cranial cavities were extremely small. The antero-posterior diameter of the boy's head was only 4½ inches; the transverse diameter less than 4 inches. The antero-posterior diameter of the girl's head was 4½ inches; the transverse diameter only 3¾ inches.

"The habits of these children, so far as regards feeding and taking care of themselves, are those of children two or three years of age. They were incapable of learning to talk, and could only repeat a few isolated words. Notwithstanding, however, the extremely limited range of their intellectual powers, these children were remarkably vivacious and excitable. While awake, they were in almost constant motion; and any new object or toy presented to them immediately attracted their attention, and evidently awakened a lively curiosity. They were, accordingly, easily influenced by proper management, and understood readily the meaning of those who addressed them, so far as this meaning could be conveyed by gesticulation and the tone of the voice."

Seguin,³ who saw the Aztecs in America, thought them susceptible of a certain amount of education. "He considered them," says he, "capable of being elevated from the level of the monkey to that of obedient, sensible, and happy children. This prospect, frankly laid out, did not seem to please their keeper, either because he did not seem to believe it possible, or because he feared it would have diminished the chances of his success."

Dr James Murray Lindsay, now of the Derby Asylum, has kindly allowed me to publish the case of a very small brain which he examined. It belonged to an idiot who was admitted into the Hanwell Asylum on the 5th June 1865. She was then eleven

¹ See his paper on the *Convulsions of the Human Brain considered in relation to the Intelligence*, in the *West Riding Lunatic Reports*, vol. iii. p. 10.

² Philadelphia, 1871, p. 439. The book has an engraving of these children.

³ See *Idiocy*. New York, 1866, p. 343.

years old, and able to walk. The limbs were misshapen with rickets. She was stunted in growth, and of a childish appearance. She was unable to say a single intelligible word, but chirped like a bird. She seemed to pay no attention to sounds, save the jingling of keys or the playing of musical instruments. "She was," writes Dr Lindsay, "not nearly so intelligent as a monkey I have here, or a dog which I had at Hanwell." She died on the 16th April 1871, in the seventeenth year of her age, having been nearly six years in the asylum. "The chest, spine, and limbs, were found greatly deformed. The heart was very small, weighing $2\frac{1}{4}$ ounces, with a valvular opening near the foramen ovale. The antero-posterior diameter of the cranium was only $4\frac{1}{2}$ inches; the lateral, $3\frac{1}{2}$ inches; measured from ear to ear across the vertex, it was $8\frac{1}{2}$ inches. The calvaria were very thick and dense, especially in front and near the parietal ridges. The brain weighed no more than 13 ounces. The convolutions were shallow and few in number. The cerebrum was wanting in development posteriorly, and did not overlap the cerebellum. The brain-substance was softened and watery throughout. The ventricles were dilated with serum. The choroid plexuses were œdematous." Thus the brain was not only extremely small, but what was of it was diseased.

In an Indian Report we have a notice of a brain even smaller than this in the Bareilly Asylum. "During the year," writes Dr J. H. Lock,¹ the superintendent, "one of two microcephalous idiots in the asylum died of dysentery; he was unable to articulate, walked very weakly, with a half-running gait, could only be made to understand about his wants for food and clothing; and was, in fact, very little raised above the condition of one of the lower animals. I am sorry I cannot give his weight, but his height was 4 feet 8 inches, and the weight of his brain—cerebrum, $6\frac{1}{2}$ ounces; cerebellum, $3\frac{1}{2}$ ounces; pons and medulla oblongata, $\frac{1}{4}$ ounce. The convolutions were rather flatter than usual on the lower side of the brain, and the middle lobe was less prominent below than it generally is; otherwise the brain was normal."

Vogt believes microcephaly to be a case of atavism, the appearance of a type of brain inherited from some very remote ancestral ape. As an illustration, he gives the occasional appearance of the two supplemental toes in the horse, which, he thinks, indicates its descent from the hipparion, an extinct animal of the Pleiocene period, which had two shorter toes on each side of the hoof—somewhat like the posterior toes of the deer and ox. This, Vogt observes, disappears teratologically as an arrest of development, for in the embryo horse the representatives of the lateral toes appear, but only to be incorporated at an early date with the single

¹ See General Report, No. 4, on Lunatic Asylums, Vaccination, and Dispensaries in the Bengal Presidency for the year 1871, compiled by Assistant-Surgeon K. McLeod, A.M., M.D. Calcutta, 1873, p. 25.

row of metacarpal bones and phalanges. In the same way, the brain of the microcephalic idiot is the result of arrested development of a human brain checked in its evolution at the simian stage.

The observations of Gratiolet are far from confirming this theory. "The study of the brain of microcephales", he writes,¹ "has furnished me with other reasons for proving through anatomy the absolute distinction of man. On comparing attentively the brain of apes with that of men, I found the arrangement of the central convolutions to be in adult age the same in both groups. If one went no further, there would not be sufficient grounds to separate man from animals in general, but the study of development gives us a real distinction. The temporo-sphenoidal convolutions appear first in the brain of the ape, and the frontal lobe last; but exactly the opposite takes place with man—the frontal convolutions appear first, the temporo-sphenoidal last. Thus the same series is repeated in the one case from Alpha to Omega in the other from Omega to Alpha.

"From this fact, which was rigorously verified, there flows a necessary inference: no arrest of development can make the human brain more nearly resembling that of the ape's than it is in the adult; far from that, it will differ so much the more the less developed it is. This inference is completely justified by the view of the microcephalic brain. At first it might be taken for the brain of some new and unknown ape; but the slightest attention is enough to save one from this error. In the ape the parallel fissure is long and deep, and the sphenoidal lobe is marked by complicated furrows. In the microcephale, on the other hand, the parallel fissure is always incomplete, and sometimes wanting, and the sphenoidal lobe is almost entirely smooth. That is not all: in the microcephale the second bridging convolution, between the parietal and occipital lobes, is always superficial, a character peculiar to man.² In the pithecæ, on the contrary, the convolution is constantly hid under the operculum of the occipital lobe. Thus, in the depth of their degradation, the brain of the microcephale presents human characters often less voluminous and less convoluted than those of the ourang or chimpanzee; they do not become similar. The microcephale, however low he may be, is not a beast, but a diminished man.

"I have examined the question, Does microcephaly precede birth? Of this there can be no doubt. In one of the cases of microcephaly which I have studied, the general form of the brain and of the fissure

¹ *Mémoire sur la Microcéphalie considérée dans les Rapports avec la Question des Caractères du Genre Humain, par le Docteur Pierre Gratiolet; Journal de la Physiologie de l'Homme et les Animaux.* Paris, 1860, p. 110.

² Professor Turner is inclined to doubt the correctness of the views of Gratiolet on this point. See his "Notes on the Bridging Convolutions in the Brain of the Chimpanzee," from the Proceedings of the Royal Society of Edinburgh, 1865-66.

of Sylvius showed that the monstrosity was at least contemporary with the fifth month. It is probable that this state depends upon some cause: early under the influence of some primordial generative weakness (*asthénogénie primordiale*), forms are produced which differ from all normal states. Moreover, in the new-born child, in its normal condition, the arrangement of the cerebral convolutions is complete in all its parts. If microcephaly were after birth, these convolutions would remain, and the volume of the brain alone would be diminished; but it is not so; the growth has languished from the beginning, its fold is shortened, and has stopped growing too soon."

Gratiolet remarks that those microcephales in whom the convolutions are so little complicated are all dwarfs.

The brain of Sophie Wyss, of whom there is a detailed account in Vogt's work, was exhibited by Dr Cramer at a meeting of medico-psychologists at Zurich.¹ Its capacity was 360 cc. Two other brains of microcephales were shown at the same time. In all these brains Dr Cramer pointed out the island of Reil was uncovered by the temporal and parietal gyri, while in the monkey the island is always covered.

Dr Cramer had, however, read of microcephalic brains which approached more nearly those of the ape.

In the microcephales the impressions of the senses are lively. They are fond of moving about, but have little power of continuous attention. Their restless motions recall those of the butterfly. It would appear that they are late in learning to walk; but in general they have the free use of their limbs, which Gratiolet accounts for by the comparatively large development of the cerebellum.

If the brain be healthy, the prognosis is better than that of many cases where the brain, though of normal size, is the seat of chronic disease. I have heard of several cases where, though the head was very small, the mental manifestations were greater than one would be disposed to believe; but I am not inclined to repeat details where I cannot furnish measurements more precise than those reproduced from the memory.

Vogt and other disciples of Darwin see in the mental characteristics of the microcephalic idiot something resembling those of the anthropoid ape. It seems to me that the intelligence of a monkey is very different from that of an idiot. You cannot reach the simian intellect merely by deducting so much from the human. It is different in kind as well as in degree. One might as well expect to find the same character of intelligence in an infant of two months old and in a full-grown chimpanzee, because the cranial contents were about the same. The mental powers which the monkey possesses are in perfect accordance with his organism. His agility in climbing and swinging himself from branch to

¹ See the *Correspondenz-Blatt für Psychiatrie und gerichtliche Psychologie*. Februar 1873.

branch is something marvellous. I have seen whole flocks of monkeys running down a wooded hillside with the greatest rapidity, without ever touching the ground, leaping from one branch to another, sometimes laying hold with the superior, sometimes with the inferior extremities, never tumbling, and scarcely ever missing their aim. This demands some kind of mental as well as physical powers, and cannot be clouded over by the vague word instinct. Monkeys, as every one knows, are extremely alert, watchful, and nimble; very careful against wild animals; they do not lie down to sleep, but sit upon trees all night; their slumbers are very light; they are attached to and careful of their young. On the contrary, microcephalic idiots, though in general more lively than those of other classes, have no fondness for climbing, and are as destitute of animal instincts as they are of human intelligence. They have no powers either of feeding or protecting themselves from danger, and if left to themselves would soon perish. They present the effaced lineaments of a human being, which only a wandering fancy will mistake for those of an ape. What qualities they have are of a human character. They laugh at what amuses them; they have human sympathies and human affections. Where they learn a few words, they use them as human beings do to signify things. Their tendency to imitation is often strong, and reminds a superficial observer of the monkey; yet imitation is also strong in the human being, especially in children. The resemblance between microcephales and apes seems to me to rest especially upon the negative quality of stupidity. Vogt remarks that many of them do not speak at all; but then it is clear the cases he describes never received that species of training which is required for beings of their low mental capacity. I cannot at present recall more than two cases of microcephalic idiots who were sent to a training school. In both the head was very small. In one who is at present in the Royal Albert Asylum at Lancaster,¹ the dimensions are, or were in 1871—

| | Inches. | Centimetres. About |
|----------------------------|-----------------|-----------------------|
| Anterio-posterior, | $7\frac{7}{8}$ | $19\frac{1}{2}$ |
| Circumference, | $14\frac{1}{4}$ | 36 |
| Transverse, | $9\frac{1}{8}$ | 25 |

This little fellow is thus noticed in the Report for 1872 of the Royal Albert Asylum:—

“F. Y. P., admitted February 1871, aged 7. An active, restless boy, with peculiarly small head. On admission speech was absolutely wanting, and the power of attention was very feeble. Now (September 1872) says after teacher ‘P,’ ‘I,’ ‘see,’ ‘me,’ ‘D,’ and ‘C,’ and is an attentive pupil at object-lessons.”

¹ See the Journal of Mental Science for July 1872, p. 303, and for October 1872, p. 351.

A boy is mentioned by Dr Wilbur, in his Report of the New York State Idiot Asylum for 1857, who had a head of only 13½ inches in circumference. He was admitted at the age of eleven, and was mute. After a year he learned the names of all the objects in the school-room and about the house, and the names of all the pupils in the school. It may be here noticed that though many idiots are mute, I cannot recall a single instance where an idiot picks up words which he cannot understand, like a parrot or a starling; and they often understand what is said to them years before they commence to speak, and some who understand many words remain mute for life. I know of one small-headed idiot who seems somewhat dull of hearing; he only uses two words, "me" and "no," but always in a correct sense, whether separately or combined.

Congenital Idiocy.

The phrase congenital or born idiocy is no new one. Idiocy, writes M. Parchappe,¹ depends upon congenital atrophy of the brain; idiotism upon an atrophy following upon a chronic affection. Other French physicians have used the term idiocy to signify a congenital vice; imbecility to denote a disease acquired after birth. It ought to be noted that the term congenital idiocy is here employed in a somewhat different sense to comprehend all those cases which, shrouded in the obscurity of intra-uterine existence, cannot be traced back to any known specific disease. It thus comprehends the cases whose pathology cannot be properly diagnosed till after death. Thus, cases of inflammation of the brain occurring before death are, as far as my knowledge reaches, not distinguishable from other congenital cases. A microcephalic idiot is a born idiot, but I do not include him under the term congenital. In process of time, by carefully studying the symptoms in life and the lesions after death, we may be able to resolve congenital idiocy into some new or old classes. In the meantime, a large number of our cases must still be included under the heading of congenital idiots. At present, if we cannot classify them in a more precise way, we at least may save confusion by putting them aside from the other classes, and inviting attention to the unresolved problems which they represent.

The predisposing causes which have been assigned for congenital idiocy are numerous, but their operation is vaguely understood. Anxiety and fright to the mother during gestation is frequently put down as the original cause. As may be supposed, there is often a hereditary connexion—insanity, epilepsy, or some other nervous disease, is known to exist in the family; and sometimes, too, the tendency has been intensified by a consanguineous marriage. In these cases occasionally the child is born idiotic, and grows up with-

¹ *Récherches sur l'Encephale, sa Structure, ses Fonctions, et ses Maladies*, par M. Parchappe. Paris, 1838, p. 58.

out taking any fits, while another child, born apparently with normal intelligence, inherits a tendency to fits which bring on idiocy in their course. Jastrowitz has indicated hydramnios as a probable cause of congenital idiocy. Professor Betz¹ of Vienna, in a demonstration of the brains of an imbecile and two idiots, has noted the difference of the convolutions. He finds the characteristic distinction in the arrangement of the gray matter, which is different both from the normal human brain and from that of the ape. The bridging convolutions at the base of the external occipital fissure were found deficient in the idiots. In normal human beings the gray substance of the brain is a conjoined mass; in these idiots the connexions were not so close (*auseinander geworfen*).

It seems very probable, from the researches of Jastrowitz and other microscopists, that the deficiency in congenital idiocy may consist in the structure of the tissues of the brain, in the persistence of anatomical elements which are normal in the embryo, but which ought to have passed into another form for the mature human being.

A very common accompaniment of congenital idiocy is the keel or saddle-shaped palate. The palate within the alveolar processes resembles the impression made by the keel of a ship, or the inside of a saddle looked at from behind; the jaw is narrow rather than long, and the furrow in the middle becomes deeper towards the back of the hard palate. The teeth are generally bad; about the age of ten or twelve they commence to look black near the margin of the gum, and rapidly decay and fall to pieces, so that many idiots before they are twenty years of age have nothing but a few blackened stumps. The teeth generally decay most rapidly in the upper jaw. I believe that deformities of the heart are also common with congenital idiots. The organ is small and feeble; the valves close imperfectly, or there is an open foramen ovale; the circulation is feeble, and the extremities are habitually cold. Other deformities are met with in different parts of the body; the most common are hernia, clubfoot, wad-shaped fingers, squinting and rolling of the eyes.

Congenital idiots are seldom well made, often of the scrofulous diathesis; sometimes, however, they are strong and good-looking, with well-formed heads, good teeth, and no deformities whatever.

Congenital idiots present every variety of mental power or feebleness, and are not less educable than other classes.

Cretinism.

While little of a scientific character has been written on sporadic idiocy, the literature of cretinism is very extensive; but it is not my intention to enter at any length into the subject, though, for the sake of clearness, it is difficult to avoid going over what seems to be the most important points made out in connexion with this interesting disease. The definition of cretinism reposes more upon

¹ Psychiatrisches Centralblatt, Nr. 7, 25 Juli 1873.

its etiology than upon its pathology; for, in our imperfect state of knowledge, etiology sometimes guides us to true pathology, and pathology leads us back to new views on etiology; as difference in the cause implies difference in the effect, and a different effect implies a new cause or combination of causes. Cretinism is an endemic disease, its areas being generally capable of clear definition. It is very common in certain valleys of the Alps, where it has attracted most attention; but it is not confined to any quarter of the globe. It has been found amongst the Cordilleras as well as the Himalayas, the Pyrenees as well as the Crapak Mountains, in Chinese Tartary, in Sumatra and Java, in the Isthmus of Darien, in Madagasear, and many other places. It is not confined to valleys of mountainous countries, being found in parts of the Terai, at the foot of the Himalayas, in some villages in the Punjab, and in the plains of Lombardy and the Black Forest of Baden. It is, however, most common in shut-up valleys, and has a close, though unexplained, connexion with goître. Nowhere does cretinism occur where goître is absent; but goître may occur where cretinism is unknown or rare.

The specific cause—something in the air, earth, or water, or in all of them, like the malaria of intermittent fever—is only known through its effects on the human body. It has not yet been isolated either by inference or experiment; and, indeed, we know less of it than about the character of paludal miasma. The accumulation of decaying vegetable matter in certain situations, and at known temperatures, will surely cause the appearance of ague amongst those dwelling near; but there are many shut-in valleys, resembling in all respects the usual haunts of cretinism, where, nevertheless, it is never heard of.

It seems to be more common on rocks of magnesian limestone, but is also known to be rife in valleys where the primary or schistose rocks are the main or only formations. It is not hereditary in the constitution of the parent. A man and his wife with hereditary tendency to insanity cannot avoid transmitting the vice to the children, should they flee to the ends of the earth; but parents leaving the valleys of the Aosta, or the Isère, or the Valais, for places where cretinism is unknown, leave behind them the danger of having cretin children. On the other hand, the intermarriage of goïtrous parents, or where the woman is cretinous, as sometimes happens, increases the danger of cretinism in the children.

In describing the appearance of cretins, authors have collected deformities from different cases, so as to make up the portrait of a monstrous creature, which assuredly is rarely to be met with. The most characteristic traits which occur in cretins are the stupid, monotonous facial expression, the nose depressed at its root and broad at the wings, the remarkable distance between the eyes, occupied by a hollow, from which the root of the nose seems to issue; the eyes, dull and heavy, the broad zygomatic arch, the wide mouth, the

broad lips, and the thick tongue. The teeth are generally bad, and soon come to decay; sometimes first teeth are not renewed. Cretins rarely attain the usual height. Many are dwarfs no higher than three feet. The limbs are often disproportioned, the walk awkward—what is called the “Bärengang” or bear gait in the German parts of Switzerland. The neck is generally short and thick, and from one-third to two-thirds of cretins are said to have *goître*.

Virchow has called attention to the early synostosis of the sphenobasilar bone in cretins, which causes the clivus to descend with an unusually rapid slope, so that it approaches to a right angle in relation to the body of the sphenoid. This prevents the elongation of the base of the skull, and consequently of the brain, from the foramen magnum to the crista galli.

In a new-born cretin which was carefully dissected by Virchow, the whole length of the base of the brain was found fourteen to sixteen millimetres less than usual, and the angle between the posterior part of the sphenoid and basilar bone was from 42° to 46° more acute than normal. The synostosis of the sphenoid and basilar bone had already taken place. I have no intention of entering at present into the question whether this condition is a necessary cause—a frequent or invariable concomitant of cretinism. Virchow does not explain, on physiological grounds, why a diminished growth of a part of the base of the brain should cause idiocy. The sutures on the upper part of the skull generally remain open in cretins, allowing the hemispheres to increase to a normal size, and even on the floor of the cranium there are other sutures which remain open, and allow room for the growth of the base of the brain, both laterally and longitudinally.

The older observers paid more attention to the state of the brain than to that of the sutures; but they could not fail to observe the unusual steepness of the basilar portion of the occipital bone, which made it descend almost at a right angle to the sphenoid. Aekerman¹ had observed this in two skulls which he had seen in the Museum at Padua. Foderé² quotes the dissections of Malacarne to the same effect. A greater size of the jugular foramina in cretins has also been noticed by many observers. A collection of the lesions and deformities found in cretins is contained in the Sardinian Report on Cretinism. They are of a diversified character; and one reason of this, no doubt, is, that all cases of idiocy occurring in districts where this form of idiocy is endemic are classed as cretins: thus, hydrocephalus and cerebral hæmorrhage are put down

¹ See Aekerman über die Kretinen eine besondere Menschenabart in den Alpen. Gotha, 1790, s. 33–34.

² Foderé, *Traité du Goître et du Cretinisme*. Paris, An. VIII., para. LXXXI., p. 145.

Doctors Eulenberg and Ferd. Marfels, in a little book, *Zur Pathologischen Anatomie des Cretinismus*, Wetzlar, 1857, confirm the observations of Virchow by new ones of their own.

as lesions found in the brains of cretins; but we have no proof that the miasma which causes cretinism, whatever it may be, acts so as to exclude other causes which produce idiocy in countries where cretinism is unknown, and strangers coming into the countries where the disease is endemic have children who become cretins. It has been known from time immemorial in Valais, as well as the canton of Berne and elsewhere, that mothers who pass the last months of their pregnancy and bring up their children for several years at high elevations where cretinism is unknown, can thus save them from the disease. According to the Count Rambuteau, Prefect of the Simplon in 1813, many children remain perfectly healthy for the first five or six months of their lives, frequently as long as three or four years, when suddenly symptoms of cretinism appear, and rapidly progress. The children who afterwards become cretins are often born with a small goitre; but many cretins have no goitre, and many children with goitre are not cretins. Children with a well-marked tendency to cretinism can be often saved from it by being shifted to places where it does not appear. Sometimes the intelligence of the cretin seems to grow like that of other children; but it gradually begins to be arrested. Guggenbühl, who was the first to educate cretins in a successful manner, laid considerable stress upon conveying his patients to a healthy situation beyond the reach of the endemic cause. He claimed to have made a number of total cures, and the improvement of his cases was attested by many competent authorities, some of which are cited in his work. I have, however, been assured by the teachers of several training schools visited by me in Switzerland, that cretins do not seem to improve under training any faster than idiots of other classes.

Idiocy by Deprivation.

This condition, if it be not idiocy, simulates it so closely, that it is needful to say a few words about it. As is finely stated in the aphorism quoted by Sir William Hamilton: *Cognitio omnis a mente primam originem, a sensibus exordium habet primum.*

A being deprived of sight and hearing, the two senses most useful in perception, is, even when in possession of a potential intellect of good capacity, in reality an idiot as far as its relations with the outer world go. It is a mere recipient of sensations, from which it cannot, without some very special culture, deduce sufficient explanations of the phenomena of the outer world for it to act like a reasonable being. The famous case of Laura Bridgman, as well as that of Meystre, and some others less known, are memorable examples of what a very skilful and patient education may do in awakening the dormant activity of the mind when the principal channels of sense are cut off.

Laura Bridgman lost her sight and hearing at the age of two years; the sense of smell was at the same time almost destroyed, and that of taste much blunted. She had suffered from fits in

infaney, but seemingly without injury to her mental faculties. Meystre was blind and deaf. They were both taught the finger-language, and Meystre was even taught to speak a little. Idiocy by deprivation is like a seed which does not sprout because it is kept away from sunlight and moisture, while incurable idiocy is like a seed in which the germinal faculty has been destroyed; and the higher grades of idiocy resemble seeds in which the germinal capacity is much impaired, and the growth enfeebled, so that they require unusual stimulants. I have met with several cases of idiots who were deaf; with others who were blind, or nearly so; and either of these deficiencies, of course, when combined with mental torpor, is a very serious bar to instruction. In a child of ordinary capacity, deafness is a much greater obstacle to instruction than blindness; but it may admit of some doubt whether this is the case with idiots, at least with idiots of the lower grade, where the power of seizing abstract ideas is deficient, and who often are unable to learn more of the outward world than is gained from observing its more superficial phenomena.

Kaspar Hauser, who appeared suddenly on the 26th of May 1828 at the Halle gate of Nuremburg, at first resembled an idiot in many things, but rapidly improved under judicious instruction. It appeared, from the explanations which he was able afterwards to give, that he had been shut up since early childhood in a small cellar, neither seeing the light nor hearing any one speak. It turned out, however, that he had some faint recollections of a happier life, and remembered a few Hungarian words. He was murdered on the 14th of December 1833, probably by some one who wished the secret of his origin to remain undiscovered. It may be noticed that the truth of his singular story has been questioned—as far as I can judge, on insufficient grounds.

Eschricht, a Danish physiologist, brought forward the theory that Kaspar Hauser was a case of cure from idiocy—a notion easily refuted by his old preceptor Daumer.¹

There are a number of accounts of children who have been carried away by wolves, monkeys, or other wild animals, or who were caught straying in the woods. Many of these are perhaps as little worthy of credit as the story of Romulus and Remus; others are strongly attested, and seem to be true, though the details are perhaps heightened by the desire of exciting wonder or horror. In some of these cases it appears that the suggestive education which had been given to the brutish propensities had so overpowered the intellectual faculties, that these unfortunate beings remained in a state partaking of imbecility or insanity for years after, and in some cases for life. They disliked clothes, were dirty in their habits, fed like brutes, and used few words, or could scarcely be brought to speak at all.

¹ Enthüllungen über Kaspar Hauser, von E. Fr. Daumer. Frankfurt, 1859.]

I have only to add at present, that in trying to reduce all cases of idiocy which I have seen to these ten classes, I do not imagine that this arrangement will be found final. The sure advance of pathology must lead to changes in nosology, and the Protean forms of disease now and then present groups of symptoms for which the mind has prepared no satisfactory class. New divisions might even be anticipated, were I not averse to the premature fabrication of classes and names. The term choreic idiocy is not unfrequently used ; but though chorea is not rare as a complication with idiocy, I have seen no case where it could with truth be put down in a causal connexion.